AMENDMENT NO. 4 OCTOBER 2023

TO

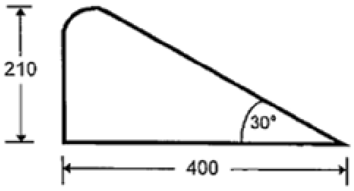
IS 2553 (PART 2) : 2019 SAFETY GLASS — SPECIFICATION

PART 2 FOR ROAD TRANSPORT

(*First Revision*)

(*Page* 3, *clause* **3.23.2**) — Insert the following new clause and figure after **3.23.2**.

‘**3.24 Smallest Angle** — The smallest angle among any adjacent sides of any pane as depicted below.’



(*Amendment No*. 2, *Page* 1, *Table* 1) — In the row of 227 g ball test for laminated glass (XI), substitute the existing clause number **5.5.1.2** with clause number **5.5.2.1**.

Price Group 4

(*Amendment No.* 2, *Page* 2, *Table* 1-A) — Substitute the following for existing:

Table 1-A Summary of Performance Requirements for Agricultural Tractor

(*Clause* 5)

Sl No.		**Windscreen**						**Panes**							
		Laminated Glass		**Glass Plastics**	**Toughened Glass**		**Uniform Toughen Glass**	**Uniform Toughen Glass**		**Laminated Glass**		**Double Glazed Unit**	**Glass Plastics**	**Rigid Plastic**	**Flexible Plastic**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	Marking	II	II/P	IV	I	I/P	VII		P	XI	XI/P	VI	XII	VIII	IX
ii)	Light transmittance	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1
iii)	Resistance to abrasion	5.1.2	5.1.2	5.1.2					5.1.2	5.1.2	5.1.2		5.1.2	5.1.2	
iv)	Resistance to temperature changes		5.2.1	5.2.1		5.2.1			5.2.1		5.2.1		5.2.1		
v)	Resistance to fire		5.2.2	5.2.2		5.2.2			5.2.2		5.2.2		5.2.2	5.2.2	5.2.2
vi)	Resistance to chemicals		5.2.3	5.2.3		5.2.3			5.2.3		5.2.3		5.2.3	5.2.3	5.2.3
vii)	Resistance to radiation	5.3.1	5.3.1	5.3.1		5.3.1			5.3.1	5.3.1	5.3.1		5.3.1		
viii)	Resistance to high temperature	5.3.2	5.3.2	5.3.2					5.3.2	5.3.2	5.3.2		5.3.2		
ix)	Resistance to humidity	5.3.3	5.3.3	5.3.3		5.3.3			5.3.3	5.3.3	5.3.3		5.3.3	5.3.3	
x)	Optical distortion	5.4.1	5.4.1	5.4.1	5.4.1	5.4.1	5.4.1								

Sl No.		**Windscreen**						**Panes**							
		Laminated Glass		**Glass Plastics**	**Toughened Glass**		**Uniform Toughen Glass**	**Uniform Toughen Glass**		**Laminated Glass**		**Double Glazed Unit**	**Glass Plastics**	**Rigid Plastic**	**Flexible Plastic**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
xi)	Image separation	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2								
xii)	Fragmentation				5.8.2	5.8.2	5.5.1.1	5.5.1.1	5.5.1.1						
xiii)	Head-form	5.4.3	5.4.3	5.4.3	5.8.3	5.8.3						5.5.3.2		5.6.1	
xiv)	2.260 g ball	5.4.4	5.4.4	5.4.4											
xv)	227 g ball	5.4.5	5.4.5	5.4.5			5.5.1.2	5.5.1.2	5.5.1.2	5.5.2.1	5.5.1.2		5.5.1.2	5.6.2	5.7.1 and 5.7.2
xvi)	Flexibility and fold													5.6.3	5.7.3
xvii)	Weathering													5.6.4	5.7.4
xviii)	Cross-cut													5.6.5	

[(*Amendment No.* 2, *Page* 3, *clause* **5.4.2**, *Table* (*first row third column*)] — Substitute 'Maximum values of the separation of the primary and secondary images' *for* 'Maximum values of Optical Distortion'.

(*Amendment No.* 2, *Page* 4, *clause* **5.4.3**) — Substitute the following clause before the notes.

'**5.4.3** *Head Form Test*

When tested in accordance with **6.5**, at the drop height of 1.5 m + 0/– 5 mm (for tests on actual wind screen as per **6.5.3**) or 4.0 m +15/– 0 mm (for tests on flat test pieces as per **6.5.2**), the windscreen shall meet the following requirements.'

(*Amendment No.* 2, *Page* 4, *clause* **5.4.3.2**) — Substitute '4.0 m + 15/– 0 mm' *for* '4.0 m + 25 – 0 mm'.

(*Amendment No.* 2, *Page* 5, *clause* **5.8.2.3.2**) — Substitute '50 cm long' *for* '50 m long'.

(*Page 15, clause* **6.6.1.5.4**) — Insert the following new clause after **6.6.1.5.4**:

'**6.6.1.6** *Alternate test method*

6.6.1.6.1 Hazemeter, shown diagrammatically in Fig. 5(A) and consisting of:

6.6.1.6.1.1 A light source of colour temperature 2 856 K ± 50 K and a photodetector, and the combination shall be filtered to provide an output corresponding to the luminosity response of the 1931 CIE Standard Colorimetric Observer with CIE Standard Illuminant A. The output shall be proportional to within 1 percent to the incident flux over the range of flux used. The photometric stability for source and detector shall be constant throughout the test of each test piece.

6.6.1.6.1.2 An integrating sphere to collect transmitted flux; the sphere may be of any diameter as long as the total port areas do not exceed 4.0 percent of the internal reflecting area of the sphere. The entrance and exit ports shall be centred on the same great circle of the sphere, and there shall be at least 2.97 rad (170°) of arc between centres. The exit port shall subtend an angle of 0.14 rad (8°) at the centre of the entrance port. With the light trap in position, without the test piece, the axis of the irradiating beam shall pass through the centres of the entrance and exit ports. For a hazemeter, position the photocell or photocells on the sphere 1.57 rad ± 0.17 rad (90° ± 10°) from the entrance port and baffle it from direct exposure to the entrance port. In the pivotable modification where the interior wall adjacent to the exit port is used as the reflectance reference, the angle of rotation of the sphere shall be 0.140 rad ± 0.008 rad (8.0° ± 0.5°).

6.6.1.6.1.3 Illuminate the test piece by a substantially unidirectional beam; the maximum angle that any ray of this beam may make with the beam axis shall not exceed 0.05 rad (3°). This beam shall not be vignette at either port of the sphere.

When the test piece is placed against the entrance port of the integrating sphere, the angle between the perpendicular to the test piece and a line connecting the centres of entrance and exit ports shall not exceed 0.14 rad (8°).

An aperture or diaphragm shall be centrally inserted in the haze measuring apparatus to centre the light beam on the abraded track and limit it to a diameter of 7 mm ± 1 mm at the test piece.

When the reduced light is unobstructed by a test piece, its cross section at the exit port shall be approximately circular, sharply defined, uniformly bright, and concentric within the exit port, leaving an annulus of 0.023 rad ± 0.002 rad (1.3° ± 0.1°) subtended at the entrance port.

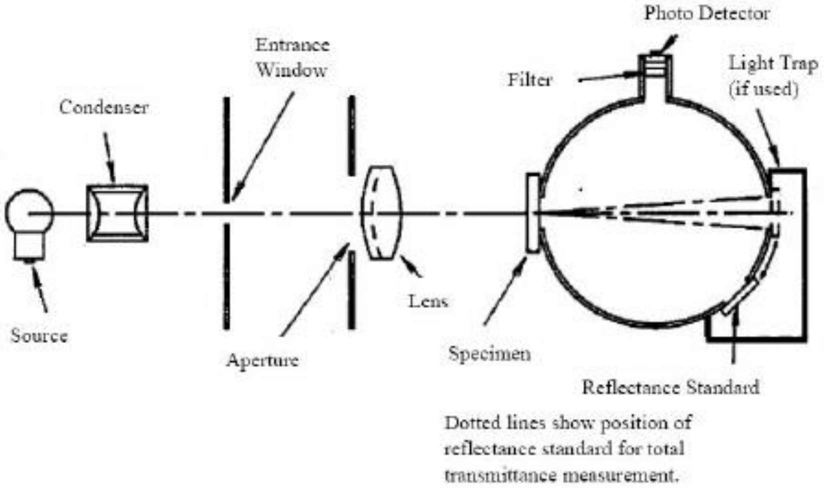
The surfaces of the interior of the integrating sphere, baffles and reflectance standard, if used, shall be of equal reflectance, matte and highly reflecting throughout the visible spectrum.

A light trap shall be provided that will absorb the beam completely when no test piece is present, or the instrument design shall obviate the need for a light trap.

Forward scattering glass standards can be used to check that the optical system of the hazemeter is properly adjusted.

6.6.1.6.1.4 *Test piece holder*

A suitable holder shall be used to permit positioning the test piece on the hazemeter so that the light beam is centred in the abradant track and the test piece is flush at the measurement port. Calibrate the hazemeter with the test piece holder before the initial measurement of the haze with no test piece present and verify that the reading of the hazemeter is zero. The whole apparatus shall be checked at regular intervals by means of calibration standards of defined haze. If haze measurements are made using equipment or methods differing from the above, the results shall be corrected in order to be in agreement with those obtained by the apparatus described above.



Dotted lines show position of reflectance standard for total transmittance measurement.

FIG. 5(A) HAZEMETER’

[*Page* 39, *Fig.* 32 (*see also Amendment No.* 2)] — Substitute the following figure for the existing:

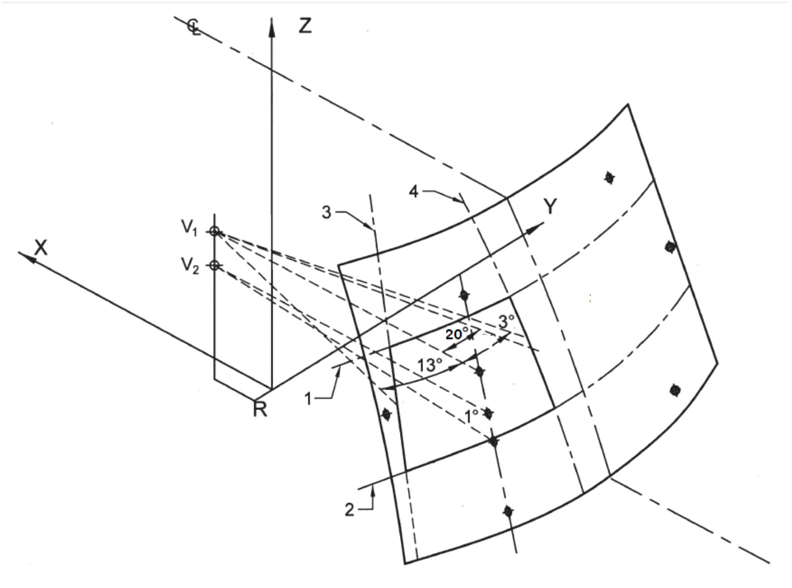


FIG. 32 TEST AREA “A” (EXAMPLE OF A RIGHT-HAND STEERING CONTROL VEHICLE)

(*Page 43, clause* **11.1**) — Substitute the following for existing:

‘**11.1** Following tests shall be done at a frequency of once in two years (*see* Table 6).’

(*Page 43, clause* **11.1**) — Insert following table number with title for table below **11.1**:

‘**Table 6 Conformity of Production Test**

(*Clause* 11.1)’

(*Page 44, clause* **12.3**) — Substitute the following for existing:

‘**12.3** In case of **12.1** (b), tests for only those parameters which are affected by the modifications need be carried out (*see* Table 7).’

[*Page* 45 (*see also Amendment No.* 2)] — Substitute the following table for existing:

Table 7 Criteria for Extension of Approval (Parameter Wise)

(*Clause* 12.3)

Sl No. (1)	**Parameter** (2)	**Whether Verification is Required** (3)
i)	Change in type of glazing	All tests
ii)	Change in interlayer type/material/thickness	All tests
iii)	Change in nominal thickness of windscreen and panes	All tests
iv)	Change in rake angle in case of windscreen	Optical distortion, secondary image separation and light transmission tests.
v)	Change in location of the ‘R’/‘H’/‘O’ point with respect to windscreen as mounted on vehicle.	In case the areas referred to in **5.4.1** and **5.4.2** are reduced maintaining the overall boundaries same, no tests are required. In case the boundaries are shifted and/or area is increased, optical distortion and secondary image separation tests need to be carried out.
vi)	Change in test area in case the earlier approval is based on Fig. 36 for windscreen	
	a) Increase in area	In case the boundaries are shifted and/or area is increased, optical distortion and secondary image separation tests need to be carried out.
	b) Decrease in area	If area is reduced maintaining the overall boundaries same, no tests need to be carried out.
vii)	Change in colour combination that is Cl + Cl or Cl + Green etc	Light transmission, optical distortion and secondary image separation test.
viii)	Changes in the toughened panes:	
	a) For flat toughened panes:	Fragmentation test
	Developed area — Increase more than + 5 percent	
	Smallest angle between two adjacent sides — Decrease more than 5 degrees	
	b) For curved toughened panes:	Fragmentation test
	Developed area — Increase more than + 5 percent	
	Smallest angle between two adjacent sides — Decrease more than 5 degrees	
	Segment height — Increase more than 30 mm	
	c) Change in colour for toughened panes	Light transmittance

Sl No. (1)	**Parameter** (2)	**Whether Verification is Required** (3)
ix)	Changes in toughened windscreen:	
	a) Change in rake angle	Optical distortion, secondary image and light transmission tests
	b) Change in colour	Optical distortion, secondary image and light transmission tests
	c) Developed area — Increase more than + 5 percent Smallest angle between two adjacent sides — Decrease more than 5 degrees Segment height — Increase more than 30 mm	Fragmentation test

(*Page* 45, *clause* **13**) — Delete.

(*Page* 45, *clause* **14**) — Renumber **14** as **13**.

(TED 06)

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